

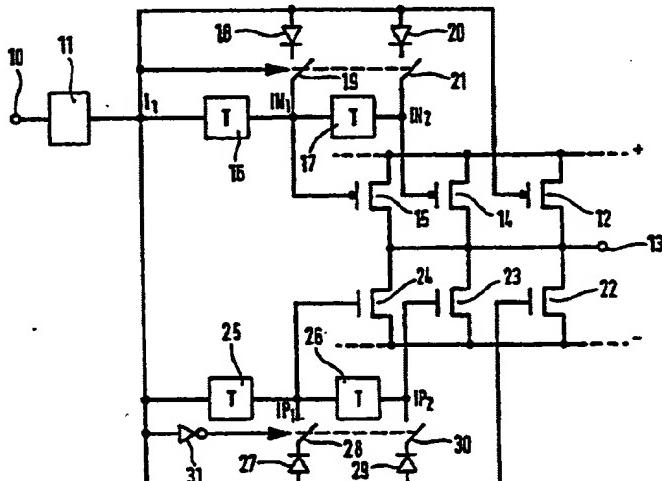
PCT

WELTOORGANISATION FÜR GEISTIGES EIGENTUM
Internationales Büro



INTERNATIONALE ANMELDUNG VERÖFFENTLICH NACH DEM VERTRAG ÜBER DIE
INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT)

(51) Internationale Patentklassifikation 5 : H03K 17/16	A1	(11) Internationale Veröffentlichungsnummer: WO 93/14568 (43) Internationales Veröffentlichungsdatum: 22. Juli 1993 (22.07.93)
<p>(21) Internationales Aktenzeichen: PCT/DE92/01076</p> <p>(22) Internationales Anmeldedatum: 22. Dezember 1992 (22.12.92)</p> <p>(30) Prioritätsdaten: P 42 00 680.5 14. Januar 1992 (14.01.92) DE</p> <p>(71) Anmelder (<i>für alle Bestimmungsstaaten ausser US</i>): ROBERT BOSCH GMBH [DE/DE]; Postfach 30 02 20, D-7000 Stuttgart 30 (DE).</p> <p>(72) Erfinder; und (75) Erfinder/Anmelder (<i>nur für US</i>): KLOSE, Hans-Peter [DE/DE]; Virchowstrasse 16, D-7412 Eningen (DE).</p> <p>(81) Bestimmungsstaaten: JP, KR, US, europäisches Patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).</p>		
<p>(54) Title: DRIVER CIRCUIT</p> <p>(54) Bezeichnung: TREIBERSCHALTUNG</p> <p>(57) Abstract</p> <p>The proposal is for a driver circuit with at least two output semiconductor switches (12, 14, 15, 22-24) in parallel and controllable by input control signals (I_1) for switching a load. To this end, a delay device (16, 17, 25, 26) is provided to delay the input control signals (I_1) of at least one of the output semiconductor switches (14, 15, 23, 24), while the input control signals (I_1) are applied without a delay to at least another of the output semiconductor switches (12, 22). The driver capacity of the driver circuit is thus retained but the edge steepness is reduced especially at low loads and the quadrature-axis current component is minimised. Peak current loads are reduced or distributed in time.</p> <p>(57) Zusammenfassung</p> <p>Es wird eine Treiberschaltung mit wenigstens zwei parallelgeschalteten, durch Eingangssteuersignale (I_1) steuerbaren Ausgangshalbleiterschaltern (12, 14, 15, 22-24) zum Schalten einer Last vorgeschlagen. Hierzu ist eine die Eingangssteuersignale (I_1) für wenigstens einen der Ausgangshalbleiterschalter (14, 15, 23, 24) zeitlich verzögernde Verzögerungseinrichtung (16, 17, 25, 26) vorsehen, während wenigstens ein anderer der Ausgangshalbleiterschalter (12, 22) unverzögert von den Eingangssteuersignalen (I_1) beaufschlagt wird. Hierdurch bleibt die Treiberfähigkeit der Treiberschaltung erhalten, jedoch vermindert sich die Flankensteilheit vor allem bei kleinen Lasten, und der Querstrom wird minimiert. Ladestromspitzen werden verringert bzw. zeitlich verteilt.</p>		



INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 02/25849

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H03K17/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H03K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 424 669 A (TEGGATZ ROSS E ET AL) 13 June 1995 (1995-06-13) column 3, line 15 -column 4, line 18; figures 2,3	1-12,15, 17-21, 23,25
Y	---	13,14, 16,22,24
Y	WO 93 14568 A (BOSCH GMBH ROBERT) 22 July 1993 (1993-07-22) page 3, last paragraph -page 5, last paragraph; figure 1 ---	13,14, 16,22,24
A	US 5 398 318 A (HIRAISHI ATSUSHI ET AL) 14 March 1995 (1995-03-14) column 8, line 55 -column 9, line 45; figures 9,10 -----	5-10

 Further documents are listed in continuation of box C. Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *8* document member of the same patent family

Date of the actual completion of the international search

19 December 2002

Date of mailing of the international search report

02/01/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel (+31-70) 340-2040, Tx. 31 651 epo nl.
 Fax: (+31-70) 340-3016

Authorized officer

Cantarelli, R